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COMPLETE SPECIFICATION

Improvements in or relating to Incandescent Electric Lamps

We, **BERTRAM BERNARD FENN**, a British Subject, of "Homefield," Raymead Road, Maidenhead, Berkshire, and **BERTRAM B. FENN LIMITED**, a British Company, of "Fenbo House," Great Chapel Street, Oxford Street, London, W.1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric incandescent lamps of the type (see, for example, Specification No. 344,865) in which the glass envelope containing the filament is formed with a multiplicity of contiguous or adjacent indentations or protuberances for the purpose of scattering the light and reducing glare.

We are aware that it has hitherto been proposed in connection with chimneys, globes, shades, electric light bulbs or like articles to form upon the outer surface of the article contiguous series of sharply defined prismatic indentations and on the inner surface corresponding series of registering counterpart projections and we make no claim to anything described or claimed in Specification No. 334 of 1897 which contains that proposal.

The present invention provides an incandescent lamp comprising a glass bulb and a bayonet or screw cap attached to a neck portion of the bulb, the whole of the surface of the bulb up to the neck being formed (by moulding) as a reticulated structure made up of a multiplicity of contiguous pyramidal cavities each with distinct triangular facets, and the neck portion of the bulb where the cap is attached having a smooth surface thereby providing a symmetrical seating and effective seal for the cap.

The invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is an elevation of the envelope used in making the lamp,

Figure 2 is a similar view showing an envelope of a somewhat different shape,

Figure 3 is a view similar to Figure 1 showing the finished lamp,

Figure 4 is a plan of a fragment of the envelope, on a substantially larger scale than Figures 1 and 2,

Figure 5 is a cross-section on the line 5-5 in Figure 4, and

Figure 6 is a diagram illustrating the effect of variations in the geometrical form of the pyramidal cavities.

Like reference numerals indicate like parts throughout the Figures.

Referring to Figures 1-5, the glass envelope 10 is moulded with a multiplicity of pyramidal cavities 11 on its outer surface, and counterpart pyramidal projections on its interior surface. The cavities are arranged in contiguous parallel rows encircling the envelope, and in each row adjacent cavities are in contiguity. The cavities in each annular row are located in register with the cavities in adjacent annular rows, and this arrangement presents on the exterior surface of the envelope a reticulated orientation formed by intersecting ridges 12, 13. The cavities diminish in size towards the closed end of the envelope and also towards the neck 14. Each cavity is arranged to form a complete (i.e. untruncated) pyramid as shown in Figure 5.

The mould employed in the manufacture of the lamp is so shaped as to leave the neck portion 14, which will be cut off during the subsequent sealing-off process, undeformed, so that a more effective seal can then be obtained and also a symmetrical seating for the cap 15 (Figure 3).

In the manufacture of the lamp the geometrical structure of the pyramidal cavities is an important factor, both as regards ease of manufacture and uniform diffusion and distribution of the light. Referring to Figure 6, the distance between the lines 16 and 17 may be taken as representing the depth of cavity which may conveniently be produced by the moulding operation. In order to facilitate the removal of the glass bulb from the mould it is desirable that the angle 18 between each pyramidal facet and the base of the pyramid should be as small as possible, preferably not greater than say 60°. From the point of view of uniform and efficient light distribu-

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tion the following requirements are essential. In the first place there should be the greatest possible number of distinct cavities per unit of area, that is to say, the "base" of each pyramidal cavity should be kept as small as possible within practical limits. Secondly, each cavity should approximate as closely as possible to a complete, that is to say untruncated, pyramid. It will be appreciated that if a cavity of the truncated form shown at 19 in Figure 6 were produced flat facets 20, which would play no part in the scattering of the emitted light, would be formed. For a similar reason the cavities should be as close together as possible, that is to say, the thickness of the ridges 12, 13 should be reduced to the minimum practical amount. It will be seen, by reference in particular to Figures 4 and 5 that the foregoing requirements are fulfilled in the lamp illustrated. It will also be noted that the shape of each cavity approximates to a regular pyramid, i.e. is bounded by four triangular facets of the same shape and size.

A window, such as 21 (Figure 1), of clear glass may be formed at a position in the neck of the envelope which will be adjacent to the cap 15 in the finished lamp. The object of this feature (which is described in British Specification No. 367,493) is to form a transparent portion through which the filament-carrying stem may be viewed from the exterior of the envelope, the positioning of the

stem being thereby facilitated. Where the positioning and sealing of the stem is effected by automatic machinery, the provision of a window such as 21 is not, of course, necessary.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An incandescent electric lamp comprising a glass bulb and a bayonet or screw cap attached to a neck portion of the bulb, the whole of the surface of the bulb up to the neck being formed (by moulding) as a reticulated structure made up of a multiplicity of contiguous pyramidal cavities each with distinct triangular facets, and the neck portion of the bulb where the cap is attached has a smooth surface thereby providing a symmetrical seating and effective seal for the cap.

2. An incandescent electric lamp as described herein with reference to Figure 3 of the drawings.

Dated this 15th day of September, 1933.

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Chartered Patent Agents.

Reference has been directed, in pursuance of Section 7, sub-section (4), of the Patents and Designs Acts, 1907 to 1932, to Specification No. 334 of 1897.

[This Drawing is a reproduction of the Original on a reduced scale.]

